INDEX TO AUTHORS

A

ADELMAN, WILLIAM J., JR., and SENFT, JOSEPH P. Dynamic asymmetries in the squid axon membrane, 102 s

ADRIAN, R. H., CHANDLER, W. K., and HODGKIN, A. L. Voltage clamp experiments in striated muscle fibers, 188 s

ALONSO-DEFLORIDA, F., DEL CASTILLO, J., GARCÍA, XAVIERA, and GIJÓN, E. Mechanism of the Schultz-Dale reaction in the denervated diaphragmatic muscle of the guinea pig, 677

ALVING, BARBARA O. Spontaneous activity in isolated somata of *Aplysia* pacemaker neurons, 29

ANDREOLI, T. E. See TOSTESON, ANDREOLI, TIEFFENBERG, and COOK, 373 s

ATWATER, ILLANI. See ROJAS and ATWATER, 131 s

AUSTIN, GEORGE. See SATO, AUSTIN, YAI, and MARUHASHI, 321

B

BAHLER, ALAN S., FALES, JOHN T., and ZIERLER, KENNETH L. The dynamic properties of mammalian skeletal muscle, 369

BAKER, P. F. Recent experiments on the properties of the Na efflux from squid axons, 172 s

BARNHILL, ROBERT. See GUTTMAN, 621, 759

BARR, L., BERGER, W., and DEWEY, M. M. Electrical transmission at the nexus between smooth muscle cells, 347

BASHIRELAHI, NASSER. See ZADUNAISKY, GENNARO, BASHIRELAHI, and HILTON, 290 s

BEAUGÉ, L. A. See SJODIN and BEAUGÉ, 152 s

BENTZEL, CARL J., DAVIES, MARTIN, SCOTT, WALTER N., ZATZMAN, MARVIN, and SOLOMON, A. K. Osmotic volume flow in the proximal tubule of *Necturus* kidney, 517

BERGER, W. See BARR, BERGER, and DEWEY, 347

BERNDT, W. O. See GATZY and BERNDT, 770

BIBER, THOMAS U. L., and CURRAN, PETER F. Coupled solute fluxes in toad skin, 606

BITTNER, GEORGE D. Differentiation of nerve terminals in the crayfish opener muscle and its functional significance, 731

BLAUSTEIN, M. P. Action of certain tropine esters on voltage-clamped lobster axon, 309

—. Barbiturates block sodium and potassium conductance increases in voltage-clamped lobster axons, 293

— and GOLDMAN, D. E. The action of certain polyvalent cations on the voltage-clamped lobster axon, 279

BRIGGS, F. NORMAN. See FUCHS and BRIGGS, 655

BRINLEY, F. J., JR. Sodium and potassium fluxes in isolated barnacle muscle fibers, 445

—. Some factors affecting sodium outflux in internally dialyzed squid axons, 149 s

BROWN, H. MACK, ITO, HIROSHI, and OGDEN, THOMAS E. Spectral sensitivity of the planarian ocellus, 255

— and OGDEN, THOMAS E. The electrical response of the planarian ocellus, 237

BRUZUAL, IRIS B. See VILLEGAS, BRUZUAL, and VILLEGAS, 81 s

BUENO, ENRIQUE J., and CORCHS, LELIO. Induced pacemaker activity on toad skin, 785

C

CANESSA-FISCHER, MITZY, ZAMBRANO, FERNANDO, and ROJAS, EDUARDO. The loss and recovery of the sodium pump in perfused giant axons, 162 s

CAPUTO, CARLO. The role of calcium in the processes of excitation and contraction in skeletal muscle, 180 s

CARVALHO, ARSELIO P. Effects of potentiators of muscular contraction on binding of cations by sarcoplasmic reticulum, 427

DEL CASTILLO, J. See ALONSO-DEFLORIDA, DEL CASTILLO, GARCÍA, and GIJÓN, 677

CELLINO, M. See FISCHER, CELLINO, GARIGLIO, and TELLEZ-NAGEL, 72 s

INDEX TO AUTHORS

A

ADELMAN, WILLIAM J., JR., and SENFT, JOSEPH P. Dynamic asymmetries in the squid axon membrane, 102 s

ADRIAN, R. H., CHANDLER, W. K., and HODGKIN, A. L. Voltage clamp experiments in striated muscle fibers, 188 s

ALONSO-DEFLORIDA, F., DEL CASTILLO, J., GARCÍA, XAVIERA, and GIJÓN, E. Mechanism of the Schultz-Dale reaction in the denervated diaphragmatic muscle of the guinea pig, 677

ALVING, BARBARA O. Spontaneous activity in isolated somata of *Aplysia* pacemaker neurons, 29

ANDREOLI, T. E. See TOSTESON, ANDREOLI, TIEFFENBERG, and COOK, 373 s

ATWATER, ILLANI. See ROJAS and ATWATER, 131 s

AUSTIN, GEORGE. See SATO, AUSTIN, YAI, and MARUHASHI, 321

B

BAHLER, ALAN S., FALES, JOHN T., and ZIERLER, KENNETH L. The dynamic properties of mammalian skeletal muscle, 369

BAKER, P. F. Recent experiments on the properties of the Na efflux from squid axons, 172 s

BARNHILL, ROBERT. See GUTTMAN, 621, 759

BARR, L., BERGER, W., and DEWEY, M. M. Electrical transmission at the nexus between smooth muscle cells, 347

BASHIRELAHI, NASSER. See ZADUNAISKY, GENNARO, BASHIRELAHI, and HILTON, 290 s

BEAUGÉ, L. A. See SJODIN and BEAUGÉ, 152 s

BENTZEL, CARL J., DAVIES, MARTIN, SCOTT, WALTER N., ZATZMAN, MARVIN, and SOLOMON, A. K. Osmotic volume flow in the proximal tubule of *Necturus* kidney, 517

BERGER, W. See BARR, BERGER, and DEWEY, 347

BERNDT, W. O. See GATZY and BERNDT, 770

BIBER, THOMAS U. L., and CURRAN, PETER F. Coupled solute fluxes in toad skin, 606

BITTNER, GEORGE D. Differentiation of nerve terminals in the crayfish opener muscle and its functional significance, 731

BLAUSTEIN, M. P. Action of certain tropine esters on voltage-clamped lobster axon, 309

—. Barbiturates block sodium and potassium conductance increases in voltage-clamped lobster axons, 293

— and GOLDMAN, D. E. The action of certain polyvalent cations on the voltage-clamped lobster axon, 279

BRIGGS, F. NORMAN. See FUCHS and BRIGGS, 655

BRINLEY, F. J., JR. Sodium and potassium fluxes in isolated barnacle muscle fibers, 445

—. Some factors affecting sodium outflux in internally dialyzed squid axons, 149 s

BROWN, H. MACK, ITO, HIROSHI, and OGDEN, THOMAS E. Spectral sensitivity of the planarian ocellus, 255

— and OGDEN, THOMAS E. The electrical response of the planarian ocellus, 237

BRUZUAL, IRIS B. See VILLEGAS, BRUZUAL, and VILLEGAS, 81 s

BUENO, ENRIQUE J., and CORCHS, LELIO. Induced pacemaker activity on toad skin, 785

C

CANESSA-FISCHER, MITZY, ZAMBRANO, FERNANDO, and ROJAS, EDUARDO. The loss and recovery of the sodium pump in perfused giant axons, 162 s

CAPUTO, CARLO. The role of calcium in the processes of excitation and contraction in skeletal muscle, 180 s

CARVALHO, ARSELIO P. Effects of potentiators of muscular contraction on binding of cations by sarcoplasmic reticulum, 427

DEL CASTILLO, J. See ALONSO-DEFLORIDA, DEL CASTILLO, GARCÍA, and GIJÓN, 677

CELLINO, M. See FISCHER, CELLINO, GARIGLIO, and TELLEZ-NAGEL, 72 s

CEREIJIDO, M., and ROTUNNO, C. A. Fluxes and distribution of sodium in frog skin. A new model, 280 s
CHANDLER, W. K. See ADRIAN, CHANDLER, and HODGKIN, 188 s
CIVAN, MORTIMER M., and FRAZIER, HOWARD S. The site of the stimulatory action of vasopressin on sodium transport in toad bladder, 589
COLE, KENNETH S. Membrane watching, 1 s
COLEMAN, R. See FINEAN, COLEMAN, KNUTTON, LIMBRICK, and THOMPSON, 19 s
COOK, P. See TOSTESON, ANDREOLI, TIEFFENBERG, and COOK, 373 s
CORCHS, LELIO. See BUENO and CORCHS, 785
CURRAN, PETER F. See BIBER and CURRAN, 606

D

DAVIES, MARTIN. See BENTZEL, DAVIES, SCOTT, ZATZMAN, and SOLOMON, 517
DESA, RICHARD, and HASTINGS, J. WOODLAND. The characterization of scintillons. Bioluminescent particles from the marine dinoflagellate, *Gonyaulax polyedra*, 105
DEWEY, M. M. See BARR, BERGER, and DEWEY, 347
DURBIN, R. P. Utilization of high-energy phosphate compounds by stomach, 233 s

E

EISENBERG, R. S. See HOROWICZ, GAGE, and EISENBERG, 193 s

F

FALES, JOHN T. See BAHLER, FALES, and ZIERLER, 369
FENICHEL, I. ROBERT. See HOROWITZ and FENICHEL, 703
FINEAN, J. B., COLEMAN, R., KNUTTON, S., LIMBRICK, A. R., and THOMPSON, J. E. Structural studies of cell membrane preparations, 19 s
FISCHER, S., CELLINO, M., GARIGLIO, P., and TELLEZ-NAGEL, I. Protein and RNA metabolism of squid axons (*Dosidicus gigas*), 72 s
FRANZ, T. J., GALEY, WILLIAM R., and VAN BRUGGEN, J. T. Further observations on asymmetrical solute movement across membranes, 1
FRAZIER, HOWARD S. See CIVAN and FRAZIER, 589
FUCHS, FRANKLIN, and BRIGGS, F. NORMAN. The site of calcium binding in relation to the activation of myofibrillar contraction, 655

G

GAGE, P. W. See HOROWICZ, GAGE, and EISENBERG, 193 s
GAINER, HAROLD, and GRUNDFEST, HARRY. Permeability of alkali metal cations in lobster muscle. A comparison of electrophysiological and osmometric analyses, 399
GALEY, WILLIAM R. See FRANZ, GALEY, and VAN BRUGGEN, 1
GARCÍA, XAVIERA. See ALONSO-DEFLORIDA, DEL CASTILLO, GARCÍA, and GIJÓN, 677
GARIGLIO, P. See FISCHER, CELLINO, GARIGLIO, and TELLEZ-NAGEL, 72 s
GATZY, J. T., and BERNDT, W. O. Isolated epithelial cells of the toad bladder. Their preparation, oxygen consumption, and electrolyte content, 770
GENNARO, JOSEPH F., JR. See ZADUNAISKY, GENNARO, BASHIRELAHI, and HILTON, 290 s
GIEBISCH, GERHARD. Some electrical properties of single renal tubule cells, 315 s
GIJÓN, E. See ALONSO-DEFLORIDA, DEL CASTILLO, GARCÍA, and GIJÓN, 677
GIMÉNEZ, MÁXIMO. See VILLEGAS, VILLEGAS, and GIMÉNEZ, 47
GLYNN, I. M., and LÜTHI, URSULA. The relation between ouabain-sensitive potassium efflux and the hypothetical dephosphorylation step in the "transport ATPase" system, 385 s
GOLDMAN, D. E. See BLAUSTEIN and GOLDMAN, 279
GRUNDFEST, HARRY. See GAINER and GRUNDFEST, 399
—. See OBARA and GRUNDFEST, 635
GULIK-KRZYWICKI, T. See LUZZATI, GULIK-KRZYWICKI, RIVAS, REISS-HUSSON, and RAND, 37 s
GUTTMAN, RITA. Effect of low sodium, tetrodotoxin, and temperature variation upon excitation, 621
—. Temperature dependence of accommodation and excitation in space-clamped axons, 759

H

HAAS, HANS G. See NARAHASHI and HAAS, 177

HAGIWARA, S., TAKAHASHI, K., and JUNGE, D. Excitation-contraction coupling in a barnacle muscle fiber as examined with voltage clamp technique, 157

HASTINGS, J. WOODLAND. See DESA and HASTINGS, 105

HAYS, RICHARD M. A new proposal for the action of vasopressin, based on studies of a complex synthetic membrane, 385

HEDLEY-WHYTE, E. TESSA. See UZMAN and HEDLEY-WHYTE, 8 s

HEMPLING, H. G. An analogue program for standing-gradient osmotic flow, 273

HERMANN, HOWARD T., and OLSEN, RICHARD E. Afferent stochastic modulation of crayfish caudal photoreceptor units, 534

HERRERA, FRANCISCO C. Bioelectric properties and ionic content in toad bladder, 261 s

HILLE, BERTIL. Charges and potentials at the nerve suface. Divalent ions and pH, 221

—. Pharmacological modifications of the sodium channels of frog nerve, 199

HILTON, MARY. See ZADUNAISKY, GENNARO, BASHIRELAHI, and HILTON, 290 s

HODGKIN, A. L. See ADRIAN, CHANDLER, and HODGKIN, 188 s

HOGBEN, C. ADRIAN M. Observations on ionic movement through the gastric mucosa, 240 s

HOROWICZ, P., GAGE, P. W., and EISENBERG, R. S. The role of the electrochemical gradient determining potassium fluxes in frog striated muscle, 193 s

HOROWITZ, SAMUEL B., and FENICHEL, I. ROBERT. Analysis of glycerol-^{3}H transport in the frog oocyte by extractive and radioautographic techniques, 703

HUNTER, F. R. Kinetic analysis of the permeability of human erythrocytes to NH_4Cl, 579

I

ISTIN, MICHEL, and KIRSCHNER, LEONARD B. On the origin of the bioelectrical potential generated by the freshwater clam mantle, 478

ITO, HIROSHI. See BROWN, ITO, and OGDEN, 255

ITO, KATSUHIRO. See TAKAGI, WYSE, KITAMURA, and ITO, 552

J

JUNGE, D. See HAGIWARA, TAKAHASHI, and JUNGE, 157

K

KERNAN, R. P. Membrane potential and chemical transmitter in active transport of ions by rat skeletal muscle, 204 s

KEYNES, RICHARD D. The thermodynamics of nerve and electric organ, 221 s

KIRSCHNER, LEONARD B. See ISTIN and KIRSCHNER, 478

KITAMURA, HARUNOBU. See TAKAGI, WYSE, KITAMURA, and ITO, 552

KLEINZELLER, ARNOST, KNOTKOVA, ANNA, and NEDVIDKOVA, JARA. The effect of calcium ions on the steady-state ionic distribution in kidney cortex cells, 326 s

KNOTKOVA, ANNA. See KLEINZELLER, KNOTKOVA, and NEDVIDKOVA, 326 s

KNUTTON, S. See FINEAN, COLEMAN, KNUTTON, LIMBRICK, and THOMPSON, 19 s

L

LEAF, ALEXANDER. See SHARP and LEAF, 271 s

LEPKE, SIGRID, and PASSOW, H. Effects of fluoride on potassium and sodium permeability of the erythrocyte membrane, 365 s

LIMBRICK, A. R. See FINEAN, COLEMAN, KNUTTON, LIMBRICK, and THOMPSON, 19 s

LÜTHI, URSULA. See GLYNN and LÜTHI, 385 s

LUXORO, M., and YAÑEZ, E. Permeability of the giant axon of *Dosidicus gigas* to calcium ions, 115 s

LUZZATI, VITTORIO, GULIK-KRZYWICKI, T., RIVAS, E., REISS-HUSSON, F., and RAND, R. P. X-ray study of model systems: Structure of the lipid-water phases in correlation with the chemical composition of the lipids, 37 s

M

MARTIN, K. Concentrative accumulation of choline by human erythrocytes, 497

MARUHASHI, JURO. See SATO, AUSTIN, YAI, and MARUHASHI, 321

MONNIER, A. M. Experimental and theoretical data on excitable artificial lipidic membranes, 26 s
MOORE, JOHN W. See NARAHASHI and MOORE, 93 s
MULLINS, L. J. Ion fluxes in dialyzed squid axons, 146 s

N

NAITOH, YUTAKA. Ionic control of the reversal response of cilia in *Paramecium caudatum*. A calcium hypothesis, 85
NARAHASHI, TOSHIO, and HAAS, HANS G. Interaction of DDT with the components of lobster nerve membrane conductance, 177
— and MOORE, JOHN W. Neuroactive agents and nerve membrane conductances, 93 s
NEDVIDKOVA, JARA. See KLEINZELLER, KNOTKOVA, and NEDVIDKOVA, 326 s

O

OBARA, SHOSAKU, and GRUNDFEST, HARRY. Effects of lithium on different membrane components of crayfish stretch receptor neurons, 635
OGDEN, THOMAS E. See BROWN, ITO, and OGDEN, 255
—. See BROWN and OGDEN, 237
OLSEN, RICHARD E. See HERMANN and OLSEN, 534

P

PAGE, ERNEST. Correlations between electron microscopic and physiological observations in heart muscle, 211 s
PASSOW, H. See LEPKE and PASSOW, 365 s

R

RAND, R. P. See LUZZATI, GULIK-KRZYWICKI, RIVAS, REISS-HUSSON, and RAND, 37 s
REHM, W. S. The metabolic state and the response of the potential of frog gastric mucosa to changes in external ion concentrations, 250 s
REISS-HUSSON, F. See LUZZATI, GULIK-KRZYWICKI, RIVAS, REISS-HUSSON, and RAND, 37 s
RIVAS, E. See LUZZATI, GULIK-KRZYWICKI, RIVAS, REISS-HUSSON, and RAND, 37 s
ROJAS, EDUARDO, and ATWATER, ILLANI. An experimental approach to determine membrane charges in squid giant axons, 131 s
—. See CANESSA-FISCHER, ZAMBRANO, and ROJAS, 162 s
ROTUNNO, C. A. See CEREIJIDO and ROTUNNO, 280 s

S

SANANES, LAURA. See VILLEGAS and SANANES, 226 s
SATO, MAKOTO, AUSTIN, GEORGE, YAI, HIDEKO, and MARUHASHI, JURO. The ionic permeability changes during acetylcholine-induced responses of *Aplysia* ganglion cells, 321
SCOTT, WALTER N. See BENTZEL, DAVIES, SCOTT, ZATZMAN, and SOLOMON, 517
SELDIN, EDWARD B. See WALD and SELDIN, 694
SENFT, JOSEPH P. See ADELMAN and SENFT, 102 s
SHARP, GEOFFREY W. G., and LEAF, ALEXANDER. On the stimulation of sodium transport by aldosterone, 271 s
SJODIN, R. A., and BEAUGÉ, L. A. Coupling and selectivity of sodium and potassium transport in squid giant axons, 152 s
SOLOMON, A. K. Characterization of biological membranes by equivalent pores, 335 s
—. See BENTZEL, DAVIES, SCOTT, ZATZMAN, and SOLOMON, 517

T

TAKAGI, SADAYUKI F., WYSE, GORDON A., KITAMURA, HARUNOBU, and ITO, KATSUHIRO. The roles of sodium and potassium ions in the generation of the electroolfactogram, 552
TAKAHASHI, K. See HAGIWARA, TAKAHASHI, and JUNGE, 157
TELLEZ-NAGEL, I. See FISCHER, CELLINO, GARIGLIO, and TELLEZ-NAGEL, 72 s
THOMPSON, J. E. See FINEAN, COLEMAN, KNUTTON, LIMBRICK, and THOMPSON, 19 s
TIEFFENBERG, M. See TOSTESON, ANDREOLI, TIEFFENBERG, and COOK, 373 s
TOSTESON, D. C., ANDREOLI, T. E., TIEFFENBERG, M., and COOK, P. The effects of macrocyclic compounds on cation transport in sheep red cells and thin and thick lipid membranes, 373 s

U

UZMAN, BETTY G., and HEDLEY-WHYTE, E. TESSA. Myelin: dynamic or stable? 8 s

V

VAN BRUGGEN, J. T. See FRANZ, GALEY, and VAN BRUGGEN, 1

VARGAS, FERNANDO F. Filtration coefficient of the axon membrane as measured with hydrostatic and osmotic methods, 13

—. Water flux and electrokinetic phenomena in the squid axon, 123 s

VILLEGAS, GLORIA M., and VILLEGAS, RAIMUNDO. Ultrastructural studies of the squid nerve fibers, 44 s

—. See VILLEGAS, BRUZUAL, and VILLEGAS, 81 s

VILLEGAS, JORGE. Transport of electrolytes in the Schwann cell and location of sodium by electron microscopy, 61 s

—, VILLEGAS, RAIMUNDO, and GIMÉNEZ, MÁXIMO. Nature of the Schwann cell electrical potential. Effects of the external ionic concentrations and a cardiac glycoside, 47

VILLEGAS, LEOPOLDO, and SANANES, LAURA. Ionic permeability and water movement in frog gastric mucosa, 226 s

VILLEGAS, RAIMUNDO, BRUZUAL, IRIS B., and VILLEGAS, GLORIA M. Equivalent pore radius of the axolemma of resting and stimulated squid axons, 81 s

—. See VILLEGAS and VILLEGAS, 44 s

—. See VILLEGAS, VILLEGAS, and GIMÉNEZ, 47

W

WALD, GEORGE. Oscillations of potential in the electroretinogram of the lobster, 261

—. Single and multiple visual systems in arthropods, 125

— and SELDIN, EDWARD B. Spectral sensitivity of the common prawn, *Palaemonetes vulgaris*, 694

WHITTEMBURY, GUILLERMO. Sodium and water transport in kidney proximal tubular cells, 303 s

WINEGRAD, SAUL. Intracellular calcium movements of frog skeletal muscle during recovery from tetanus, 65

WYSE, GORDON A. See TAKAGI, WYSE, KITAMURA, and ITO, 552

Y

YAI, HIDEKO. See SATO, AUSTIN, YAI, and MARUHASHI, 321

YAÑEZ, E. See LUXORO and YAÑEZ, 115 s

Z

ZADUNAISKY, JOSÉ A., GENNARO, JOSEPH F., JR., BASHIRELAHI, NASSER, and HILTON, MARY. Intracellular redistribution of sodium and calcium during stimulation of sodium transport in epithelial cells, 290 s

ZAMBRANO, FERNANDO. See CANESSA-FISCHER, ZAMBRANO, and ROJAS, 162 s

ZATZMAN, MARVIN. See BENTZEL, DAVIES, SCOTT, ZATZMAN, and SOLOMON, 517

ZIERLER, KENNETH L. See BAHLER, FALES, and ZIERLER, 369

INDEX TO SUBJECTS

A

Acetylcholine-induced responses of *Aplysia* ganglion cells, ionic permeability changes during, 321
Acid, ribonucleic, and protein metabolism of squid axons, *Dosidicus gigas*, 72 s
Adenosine triphosphatase system, transport, relation between ouabain-sensitive potassium efflux and hypothetical dephosphorylation step in, 385 s
Aldosterone, stimulation of sodium transport by, 271 s
Alkali metal cations in lobster muscle, comparison of permeability by electrophysiological and osmometric analyses, 399
Ammonium chloride, permeability of human erythrocytes to, kinetic analysis, 579
Aplysia ganglion cells, ionic permeability changes during acetylcholine-induced responses, 321
— pacemaker neurons, spontaneous activity in isolated somata, 29
Arthropods, single and multiple visual systems in, 125
Axolemma of resting and stimulated squid axons, equivalent pore radius, 81 s
Axon, giant, *Dosidicus gigas*, permeability to calcium ions, 115 s
—, lobster, voltage-clamped, action of certain polyvalent cations on, 279
—, lobster, voltage-clamped, action of tropine esters on, 309
— membrane, filtration coefficient measured with hydrostatic and osmotic methods, 13
— membrane, squid, dynamic asymmetries, 102 s
—, squid, water flux and electrokinetic phenomena in, 123 s
Axons, giant, perfused, loss and recovery of sodium pump in, 162 s
—, lobster, voltage-clamped, sodium and potassium conductance increases blocked by barbiturates, 293
—, space-clamped, temperature dependence of accommodation and excitation in, 759
Axons, squid, dialyzed, ion fluxes in, 146 s
—, squid, *Dosidicus gigas*, protein and ribonucleic acid metabolism, 72 s
—, squid giant, coupling and selectivity of sodium and potassium transport in, 152 s
—, squid giant, experimental approach to determine membrane charges in, 131 s
—, squid, internally dialyzed, factors affecting sodium outflux in, 149 s
—, squid, recent experiments on properties of sodium efflux from, 172 s
—, squid, resting and stimulated, equivalent pore radius of axolemma, 81 s

B

Barbiturates block sodium and potassium conductance increases in voltage-clamped lobster axons, 293
Barnacle muscle fiber, excitation-contraction coupling examined with voltage clamp technique in, 157
— muscle fibers, isolated, sodium and potassium fluxes in, 445
Bioelectric properties and ionic content in toad bladder, 261 s
Bioelectrical potential generated by freshwater clam mantle, origin of, 478
Biological membranes, characterization by equivalent pores, 335 s
Bioluminescent particles, scintillons, from marine dinoflagellate, *Gonyaulax polyedra*, characterization, 105
Bladder, toad, bioelectric properties and ionic content in, 261 s
—, toad, preparation, oxygen consumption, and electrolyte content of isolated epithelial cells of, 770
—, toad, site of stimulatory action of vasopressin on sodium transport in, 589
Blood cells, red. *See* Erythrocytes.

C

Calcium binding site in relation to activation of myofibrillar contraction, 655

Calcium hypothesis for ionic control of reversal response of *Paramecium caudatum* cilia, 85
— ions, effect on steady-state ionic distribution in kidney cortex cells, 326 s
— ions, permeability of *Dosidicus gigas* giant axon to, 115 s
— movements, intracellular, of frog skeletal muscle during recovery from tetanus, 65
—, role in processes of excitation and contraction in skeletal muscle, 180 s
— and sodium, intracellular redistribution during stimulation of sodium transport in epithelial cells, 290 s
Cardiac glycoside and external ionic concentrations, effects on nature of Schwann cell electrical potential, 47
Cell, intracellular calcium movements of frog skeletal muscle during recovery from tetanus, 65
—, intracellular redistribution of sodium and calcium during stimulation of sodium transport in epithelial cells, 290 s
— membrane preparations, structural studies, 19 s
—, Schwann, electrical potential, effects of external ionic concentrations and cardiac glycoside, 47
—, Schwann, transport of electrolytes and location of sodium by electron microscopy in, 61 s
Cells, *Aplysia* ganglion, ionic permeability changes during acetylcholine-induced responses, 321
—, epithelial, intracellular redistribution of sodium and calcium during stimulation of sodium transport in, 290 s
—, epithelial, isolated, of toad bladder, preparation, oxygen consumption, and electrolyte content, 770
—, kidney cortex, effect of calcium ions on steady-state ionic distribution in, 326 s
—, muscle, smooth, electrical transmission at nexus between, 347
—, red, blood. *See* Erythrocytes.
—, renal tubule, single, electrical properties, 315 s
—, tubular, kidney proximal, sodium and water transport in, 303 s
Chemical composition of lipids, structure of lipid-water phases in correlation with, x-ray study of model systems, 37 s
— transmitter and membrane potential in active transport of ions by rat skeletal muscle, 204 s
Choline, concentrative accumulation by human erythrocytes, 497
Cilia in *Paramecium caudatum*, ionic control of reversal response, calcium hypothesis, 85
Clam mantle, freshwater, origin of bioelectrical potential generated by, 478
Conductance increases, sodium and potassium, in voltage-clamped lobster axons, blocked by barbiturates, 293
—, lobster nerve membrane, interaction of DDT with components, 177
Conductances, nerve membrane, and neuroactive agents, 93 s
Contraction-excitation coupling in barnacle muscle fiber examined with voltage clamp technique, 157
Contraction and excitation in skeletal muscle, role of calcium in processes, 180 s
—, muscular, effects of potentiators on binding of cations by sarcoplasmic reticulum, 427
—, myofibrillar, site of calcium binding in relation to activation of, 655
Cortex cells, kidney, effect of calcium ions on steady-state ionic distribution in, 326 s
Crayfish caudal photoreceptor units, afferent stochastic modulation, 534
— opener muscle, functional significance of differentiation of nerve terminals, 731
— stretch receptor neurons, effects of lithium on different membrane components, 635

D

DDT, 1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)-ethane, interaction with components of lobster nerve membrane conductance, 177
Dephosphorylation step, hypothetical, in transport adenosine triphosphatase system and ouabain-sensitive potassium efflux, relation between, 385 s
Diaphragmatic guinea pig muscle, denervated, mechanism of Schultz-Dale reaction in, 677
Dinoflagellate, marine, *Gonyaulax polyedra*, characterization of scintillons, bioluminescent particles, from, 105

Dosidicus gigas axons, protein and ribonucleic acid metabolism, 72 s
— *gigas*, giant axon, permeability to calcium ions, 115 s

E

Electrochemical gradient, role in determining potassium fluxes in frog striated muscle, 193 s
Electrokinetic phenomena and water flux in squid axon, 123 s
Electrolyte content, preparation, and oxygen consumption of isolated epithelial cells of toad bladder, 770
Electrolytes, transport in Schwann cell and location of sodium by electron microscopy, 61 s
Electron microscopic and physiological observations in heart muscle, correlations between, 211 s
— microscopy, location of sodium by, and transport of electrolytes in Schwann cell, 61 s
Electroolfactogram generation, roles of sodium and potassium ions in, 552
Electrophysiological and osmometric analyses of permeability of alkali metal cations in lobster muscle, comparison of, 399
Electroretinogram, lobster, potential oscillations, 261
Epithelial cells, intracellular redistribution of sodium and calcium during stimulation of sodium transport in, 290 s
— cells, isolated, of toad bladder, preparation, oxygen consumption, and electrolyte content, 770
Erythrocyte membrane, effects of fluoride on potassium and sodium permeability of, 365 s
Erythrocytes, human, concentrative accumulation of choline by, 497
—, human, permeability to ammonium chloride, kinetic analysis, 579
—, sheep, and thin and thick lipid membranes, effects of macrocyclic compounds on cation transport in, 373 s
Esters, tropine, action on voltage-clamped lobster axon, 309
Ethane, 1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)-, interaction with components of lobster nerve membrane conductance, 177
Excitation and accommodation in space-clamped axons, temperature dependence, 759
Excitation-contraction coupling in barnacle muscle fiber examined with voltage clamp technique, 157
Excitation and contraction in skeletal muscle, role of calcium in processes, 180 s
—, effect of low sodium, tetrodotoxin, and temperature variation upon, 621

F

Fiber, barnacle muscle, excitation-contraction coupling examined with voltage clamp technique in, 157
Fibers, barnacle muscle, isolated, sodium and potassium fluxes in, 445
—, muscle, striated, voltage clamp experiments in, 188 s
—, nerve, squid, ultrastructural studies, 44 s
Filtration coefficient of axon membrane measured with hydrostatic and osmotic methods, 13
Flow, osmotic, standing-gradient, analogue program for, 273
—, osmotic volume, in proximal tubule of *Necturus* kidney, 517
Fluoride, effects on potassium and sodium permeability of erythrocyte membrane, 365 s
Frog gastric mucosa, ionic permeability and water movement in, 226 s
— gastric mucosa, metabolic state and response of potential to changes in external ion concentrations, 250 s
— nerve sodium channels, pharmacological modifications, 199
— oocyte, analysis by extractive and radioautographic techniques of tritiated glycerol transport in, 703
— skeletal muscle, intracellular calcium movements during recovery from tetanus, 65
— skin, fluxes and sodium distribution in, new model, 280 s
— striated muscle, role of electrochemical gradient in determining potassium fluxes in, 193 s

G

Ganglion cells, *Aplysia*, ionic permeability changes during acetylcholine-induced responses, 321
Gastric mucosa, frog, ionic permeability and water movement in, 226 s
— mucosa, frog, metabolic state and re-

sponse of potential to changes in external ion concentrations, 250 s
Gastric mucosa, ionic movement through, 240 s
Glycerol, tritiated, transport in frog oocyte, analysis by extractive and radioautographic techniques, 703
Glycoside, cardiac, and external ionic concentrations, effects on nature of Schwann cell electrical potential, 47
Gonyaulax polyedra, characterization of scintillons, bioluminescent particles, from, 105

H

Heart muscle, correlations between electron microscopic and physiological observations in, 211 s

K

Kidney cortex cells, effect of calcium ions on steady-state ionic distribution in, 326 s
—, *Necturus*, proximal tubule, osmotic volume flow in, 517
— proximal tubular cells, sodium and water transport in, 303 s
— tubule cells, single, electrical properties, 315 s

L

Lipid membranes, thin and thick, and sheep red cells, effects of macrocyclic compounds on cation transport in, 373 s
Lipidic membranes, excitable artificial, experimental and theoretical data on, 26 s
Lipid-water phases, structure in correlation with chemical composition of lipids, x-ray study of model systems, 37 s
Lithium, effects on different membrane components of crayfish stretch receptor neurons, 635
Lobster axon, voltage-clamped, action of certain polyvalent cations on, 279
— axon, voltage-clamped, action of tropine esters on, 309
— axons, voltage-clamped, sodium and potassium conductance increases blocked by barbiturates, 293
— electroretinogram, potential oscillations, 261
— muscle, comparison of permeability of alkali metal cations by electrophysiological and osmometric analyses, 399
— nerve membrane conductance, interaction of DDT with components of, 177

M

Macrocyclic compounds, effects on cation transport in sheep red cells and thin and thick lipid membranes, 373 s
Mammalian skeletal muscle, dynamic properties, 369
Man, erythrocytes, concentrative accumulation of choline by, 497
—, erythrocytes, permeability to ammonium chloride, kinetic analysis, 579
Mantle, clam, freshwater, origin of bioelectrical potential generated by, 478
Marine dinoflagellate, *Gonyaulax polyedra*, characterization of scintillons, bioluminescent particles, from, 105
Membrane, axon, filtration coefficient measured with hydrostatic and osmotic methods, 13
— charges in squid giant axons, experimental approach to determine, 131 s
—, complex synthetic, new proposal for vasopressin action based on studies of, 385
— components of crayfish stretch receptor neurons, effects of lithium on, 635
— conductance, lobster nerve, interaction of DDT with components of, 177
— conductances, nerve, and neuroactive agents, 93 s
—, erythrocyte, effects of fluoride on potassium and sodium permeability of, 365 s
— potential and chemical transmitter in active transport of ions by rat skeletal muscle, 204 s
— preparations, cell, structural studies, 19 s
—, squid axon, dynamic asymmetries, 102 s
— watching, 1 s
Membranes, asymmetrical solute movement across, 1
—, biological, characterization by equivalent pores, 335 s
—, lipid, thick and thin, and sheep red cells, effects of macrocyclic compounds on cation transport in, 373 s
—, lipidic, excitable, artificial, experimental and theoretical data on, 26 s
Metabolic state and response of frog gastric mucosa potential to changes in external ion concentrations, 250 s
Metabolism, protein and ribonucleic acid, of squid axons, *Dosidicus gigas*, 72 s

Metal cations, alkali, in lobster muscle, comparison of permeability by electrophysiological and osmometric analyses, 399
Microscopic, electron, and physiological observations in heart muscle, correlations between, 211 s
Microscopy, electron, location of sodium by, and transport of electrolytes in Schwann cell, 61 s
Mucosa, frog gastric, ionic permeability and water movement in, 226 s
—, frog gastric, metabolic state and response of potential to changes in external ion concentrations, 250 s
—, gastric, ionic movement through, 240 s
Muscle cells, smooth, electrical transmission at nexus between, 347
—, crayfish opener, functional significance of differentiation of nerve terminals, 731
— fiber, barnacle, excitation-contraction coupling examined with voltage clamp technique in, 157
— fibers, barnacle, isolated, sodium and potassium fluxes in, 445
— fibers, striated, voltage clamp experiments in, 188 s
—, frog skeletal, intracellular calcium movements during recovery from tetanus, 65
—, frog striated, role of electrochemical gradient in determining potassium fluxes in, 193 s
—, guinea pig diaphragmatic, denervated, mechanism of Schultz-Dale reaction in, 677
—, heart, correlations between electron microscopic and physiological observations in, 211 s
—, lobster, comparison of permeability of alkali metal cations by electrophysiological and osmometric analyses, 399
—, mammalian skeletal, dynamic properties, 369
—, rat skeletal, membrane potential and chemical transmitter in active transport of ions by, 204 s
—, skeletal, role of calcium in processes of excitation and contraction in, 180 s
Muscular contraction, effects of potentiators on binding of cations by sarcoplasmic reticulum, 427
Myelin, dynamic or stable, 8 s
Myofibrillar contraction activation, site of calcium binding in relation to, 655

N

Necturus kidney, proximal tubule, osmotic volume flow in, 517
Nerve and electric organ, thermodynamics of, 221 s
— fibers, squid, ultrastructural studies, 44 s
—, frog, sodium channels, pharmacological modifications, 199
— membrane conductance, lobster, interaction of DDT with components of, 177
— membrane conductances and neuroactive agents, 93 s
— surface, divalent ions and hydrogen ion concentration, 221
— terminals in crayfish opener muscle, functional significance of differentiation, 731
Neuroactive agents and nerve membrane conductances, 93 s
Neurons, crayfish stretch receptor, effects of lithium on different membrane components, 635
—, pacemaker, *Aplysia*, spontaneous activity in isolated somata, 29
Nexus between smooth muscle cells, electrical transmission at, 347
Nucleic acid, ribo-, and protein metabolism of squid axons, *Dosidicus gigas*, 72 s

O

Ocellus, planarian, electrical response, 237
—, planarian, spectral sensitivity, 255
Oocyte, frog, analysis by extractive and radioautographic techniques of tritiated glycerol transport in, 703
Organ, electric, and nerve, thermodynamics of, 221 s
Ouabain-sensitive potassium efflux and hypothetical dephosphorylation step in transport adenosine triphosphatase system, relation between, 385 s
Oxygen consumption, preparation, and electrolyte content of isolated epithelial cells of toad bladder, 770

P

Palaemonetes vulgaris, spectral sensitivity, 694
Paramecium caudatum, cilia, ionic control of reversal response, calcium hypothesis, 85
Perfused giant axons, loss and recovery of sodium pump in, 162 s

Permeability changes, ionic, during acetylcholine-induced responses of *Aplysia* ganglion cells, 321
—, ionic, and water movement in frog gastric mucosa, 226 s
— of alkali metal cations in lobster muscle, comparison of electrophysiological and osmometric analyses, 399
— of *Dosidicus gigas* giant axon to calcium ions, 115 s
— of human erythrocytes to ammonium chloride, kinetic analysis, 579
—, potassium and sodium, of erythrocyte membrane, effects of fluoride on, 365 s
Pharmacological modifications of frog nerve sodium channels, 199
Phosphate compounds, high-energy, utilization by stomach, 1, 3 s
Photoreceptor units, crayfish caudal, afferent stochastic modulation of, 534
Physiological, electro-, and osmometric analyses of permeability of alkali metal cations in lobster muscle, comparison of, 399
— and electron microscopic observations in heart muscle, correlations between, 211 s
Planarian ocellus, electrical response, 237
— ocellus, spectral sensitivity, 255
Pore radius, equivalent, of axolemma of resting and stimulated squid axons, 81 s
Pores, equivalent, characterization of biological membranes by, 335 s
Potassium efflux, ouabain-sensitive, and hypothetical dephosphorylation step in transport adenosine triphosphatase system, relation between, 385 s
— fluxes in frog striated muscle, role of electrochemical gradient in determining, 193 s
— and sodium conductance increases in voltage-clamped lobster axons blocked by barbiturates, 293
— and sodium fluxes in isolated barnacle muscle fibers, 445
— and sodium ions, roles in generation of electroolfactogram, 552
— and sodium permeability of erythrocyte membrane, effects of fluoride on, 365 s
— and sodium transport in squid giant axons, coupling and selectivity, 152 s
Potentiators of muscular contraction, effects on binding of cations by sarcoplasmic reticulum, 427
Prawn, common, *Palaemonetes vulgaris*, spectral sensitivity, 694
Protein and ribonucleic acid metabolism of squid axons, *Dosidicus gigas*, 72 s

R

Radioautographic and extractive techniques, analysis of tritiated glycerol transport in frog oocyte by, 703
Reaction, Schultz-Dale, in denervated diaphragmatic guinea pig muscle, mechanism, 677
Renal. *See* Kidney.
Reticulum, sarcoplasmic, effects of potentiators of muscular contraction on binding of cations by, 427
Ribonucleic acid and protein metabolism of squid axons, *Dosidicus gigas*, 72 s
Roentgen ray study of model systems, structure of lipid-water phases in correlation with chemical composition of lipids, 37 s

S

Sarcoplasmic reticulum, effects of potentiators of muscular contraction on binding of cations by, 427
Schultz-Dale reaction in denervated diaphragmatic guinea pig muscle, mechanism, 677
Schwann cell electrical potential, effects of external ionic concentrations and cardiac glycoside, 47
— cell, transport of electrolytes and location of sodium by electron microscopy in, 61 s
Scintillons, bioluminescent particles from marine dinoflagellate, *Gonyaulax polyedra*, characterization, 105
Sensitivity, spectral, of common prawn, *Palaemonetes vulgaris*, 694
—, spectral, of planarian ocellus, 255
Sheep red cells and thin and thick lipid membranes, effects of macrocyclic compounds on cation transport in, 373 s
Skeletal muscle, frog, intracellular calcium movements during recovery from tetanus, 65
— muscle, mammalian, dynamic properties, 369
— muscle, rat, membrane potential and chemical transmitter in active transport of ions by, 204 s
— muscle, role of calcium in processes of excitation and contraction in, 180 s

Skin, frog, fluxes and sodium distribution in, new model, 280 s
—, toad, coupled solute fluxes in, 606
—, toad, induced pacemaker activity on, 785
Sodium and calcium, intracellular redistribution during stimulation of sodium transport in epithelial cells, 290 s
— channels, frog nerve, pharmacological modifications, 199
— efflux from squid axons, recent experiments on properties of, 172 s
— fluxes and distribution in frog skin, new model, 280 s
—, location by electron microscopy, and transport of electrolytes in Schwann cell, 61 s
—, low, tetrodotoxin, and temperature variation, effect upon excitation, 621
— outflux in internally dialyzed squid axons, factors affecting, 149 s
— and potassium conductance increases in voltage-clamped lobster axons blocked by barbiturates, 293
— and potassium fluxes in isolated barnacle muscle fibers, 445
— and potassium ions, roles in generation of electroolfactogram, 552
— and potassium permeability of erythrocyte membrane, effects of fluoride on, 365 s
— and potassium transport in squid giant axons, coupling and selectivity, 152 s
— pump in perfused giant axons, loss and recovery, 162 s
— transport in toad bladder, site of stimulatory action of vasopressin on, 589
— transport, stimulation by aldosterone, 271 s
— and water transport in kidney proximal tubular cells, 303 s
Somata, isolated, of *Aplysia* pacemaker neurons, spontaneous activity in, 29
Space-clamped axons, temperature dependence of accommodation and excitation in, 759
Spectral sensitivity of common prawn, *Palaemonetes vulgaris*, 694
— sensitivity of planarian ocellus, 255
Squid axon membrane, dynamic asymmetries, 102 s
— axon, water flux and electrokinetic phenomena in, 123 s
— axons, dialyzed, ion fluxes in, 146 s
Squid axons, *Dosidicus gigas*, protein and ribonucleic acid metabolism, 72 s
— axons, internally dialyzed, factors affecting sodium outflux in, 149 s
— axons, recent experiments on properties of sodium efflux from, 172 s
— axons, resting and stimulated, equivalent pore radius of axolemma, 81 s
— giant axons, coupling and selectivity of sodium and potassium transport in, 152 s
— giant axons, experimental approach to determine membrane charges in, 131 s
— nerve fibers, ultrastructural studies, 44 s
Stomach, utilization of high-energy phosphate compounds by, 233 s
Striated muscle fibers, voltage clamp experiments in, 188 s
— muscle, frog, role of electrochemical gradient in determining potassium fluxes in, 193 s

T

Tetanus, intracellular calcium movements of frog skeletal muscle during recovery from, 65
Tetrodotoxin, low sodium, and temperature variation, effect upon excitation, 621
Thermodynamics of nerve and electric organ, 221 s
Toad bladder, bioelectric properties and ionic content in, 261 s
— bladder, preparation, oxygen consumption, and electrolyte content of isolated epithelial cells of, 770
— bladder, site of stimulatory action of vasopressin on sodium transport in, 589
— skin, coupled solute fluxes in, 606
— skin, induced pacemaker activity on, 785
Transmitter, chemical, and membrane potential in active transport of ions by rat skeletal muscle, 204 s
Triphosphatase, adenosine, transport system, relation between ouabain-sensitive potassium efflux and hypothetical dephosphorylation step in, 385 s
Tropine esters, action on voltage-clamped lobster axon, 309
Tubular cells, kidney proximal, sodium and water transport in, 303 s
Tubule cells, renal, single, electrical properties, 315 s

Tubule, proximal, *Necturus* kidney, osmotic volume flow in, 517

V

Vasopressin, new proposal for action based on studies of complex synthetic membrane, 385
—, site of stimulatory action on sodium transport in toad bladder, 589
Visual systems, single and multiple, in arthropods, 125
Voltage clamp experiments in striated muscle fibers, 188 s
— clamp technique, excitation-contraction coupling in barnacle muscle fiber examined with, 157
Voltage-clamped lobster axon, action of certain polyvalent cations on, 279
Voltage-clamped lobster axon, action of tropine esters on, 309
— lobster axons, sodium and potassium conductance increases blocked by barbiturates, 293

W

Water flux and electrokinetic phenomena in squid axon, 123 s
Water-lipid phases, structure in correlation with chemical composition of lipids, x-ray study of model systems, 37 s
Water movement and ionic permeability in frog gastric mucosa, 226 s
— and sodium transport in kidney proximal tubular cells, 303 s

X

X-ray. *See* Roentgen ray.